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ABSTRACT

To improve teacher training, a model was developed to summarize and categorize teachers' levels of current and future Internet usage in teaching. This model was intended to prepare teacher educators to help inservice teachers learn to use the Internet to support their courses. Three levels are determined by how the Internet is used educationally by teachers. This three-level model is derived from the principles of two mutually exclusive instructional approaches: explicit and implicit teaching. Level 1 use of the Internet focuses on supporting a traditional classroom setting in two areas: management and instruction. Teachers' usage of the Internet reaches Level 2 when they use the Internet in the actual delivery of instruction. Level 2 e-mail usage finds students submitting assignments as attachments or directly in the message, receiving data and answering questions through the Internet. Level 3 finds complete courses offered and received through the Internet where teachers and students interact with each other and the material exclusively via technology. From the teacher whose goal is to increase efficiency, to the teacher concerned with designing a Web-based course, the three-level model structures various types of instructional use. As teachers are trained in the use of telecommunications and the Internet, this model can direct their study from beginner level through becoming independent distance educators. (AEF)

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

A Model of Internet Usage for Course Delivery

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In the world of limited funding, where teachers' needs always seem beyond their resources, the Internet is being used to expand educational opportunity. The Internet is not specifically designed to meet the needs of teachers or of education. The Internet is a network of networks, and it is up to educators to create educational opportunity and bring the education to the Internet. Teachers are quickly realizing that the Internet is a tool with unlimited possibilities for supplementing managing and delivering whole courses.

To improve teacher training, the following model was developed to summarize and categorize teachers' levels of current and future Internet usage in teaching. Educators have embraced the use of technology in education to better "challenge the bright and more effectively engage the less able" (T.H.E. Journal, 1997, p. 8). People are gaining access to the Internet at a record pace. The Department of Education (National Center for Educational Statistics, 1996), ran a survey that showed over 50% of U.S. schools have access to the Internet. That figure rose 15% between 1994 and 1995, and the Clinton Administration has urged a national commitment to have all classrooms and libraries connected to the Internet by the year 2000 (Grabe & Grabe, 1998). This model of Internet usage will hopefully better prepare teacher educators to help inservice teachers learn to use the Internet to support their courses.

Three levels are determined by how the Internet is used educationally by teachers. Grabe & Grabe (1998) indicate that a theme of technology use in the classroom creates the need for students to have an active role in order to benefit from that technology. Traditionally, an active learner may manipulate information to help in building their own personal understanding of content, but for the Internet to be helpful, its use has to be structured and its presentation integrated for specific content. Simply exposing students to information does not ensure that learning will occur. At all three levels of Internet inclusion, the student is subject to an environment whose value to the course is completely determined by the teacher. And so, this process requires both active students and active teachers.

This three-level model is derived from the principles of two mutually exclusive instructional approaches: explicit and implicit teaching. These two instructional approaches account for the most common teaching practices (Mercer, Lane, Jordan, Allsopp, & Eisele, 1996). Level One Internet use includes an explicit approach exclusively and Levels Two and Three use an implicit approach. The transition from Level One to Level Three is based on the increase of student interaction with the Internet and course content. Both instructional approaches are "needed to address the needs of students in a diverse classroom" (Mercer & Mercer, 1998, p.142). It should be noted that Level One and Level Two are intended as supplementary to traditional course structures and not intended to provide a complete course. Level Three may include entire courses offered on the Internet. Everything from electronic mail between teachers and students to interactive Web pages for full course delivery and beyond is described in terms of this three-part model.

Level One

Level One use of the Internet focuses on supporting a traditional classroom setting in two areas: management and instruction. "Management" ranges from course support material (syllabi, reduction of paper copies, etc.). "Instruction" encompasses the direct interaction between content (from the teacher) and students.

Typically, the management of a course is a tedious and cumbersome process. The mountain of paperwork each teacher is under continues to grow and takes away valuable instructional planning time. This process is also difficult for the student who follows this paper trail. One option for using the Internet for management is to create a course Web site that can automate much of the process. This site can contain almost anything that an instructor deems important to the course. The result is increased efficiency. The student can access information from anywhere and at anytime by simply getting online. This access allows the student to track changes or updates and better follow the flow of the course.

Level One involves explicit instruction where the teacher is more directly involved. The teacher will guide the student to the information on the Internet. Discovery by the student will be controlled by the teacher and by the

structure of the content on the Internet. This requires that a teacher's preparation include scouting the Internet to find information that relates specifically to the content. Davies (1997) has indicated that advance planning for Internet use is important.

There is no creating or shaping of the Internet at this level. The teacher simply maps an activity and makes use of the already existing Internet. Students are exposed to skills and concepts in a clear and direct fashion in order to promote mastery. The approach is one of explicit teaching where the teacher and the Internet serve as the providers of knowledge. This level of use does not require that the student have any knowledge of computers beyond that of a "point and click" ability because the teacher takes the student to the information.

The Internet is analogous to a library where the teacher takes the student into the library and directly to a book (Level One). The Internet also serves as a provider of knowledge because the content on the Internet is authored by someone other than the teacher. Just like reading a book, viewing the Internet leaves the viewer subject to structure and content choices of that author. If the teacher assumes the students have some Internet access, the teacher can create a list of specific Web addresses (URLs, or uniform resource locators) to visit and specific things for the student to do. This is much like a directed worksheet where the Internet is the medium. In the library analogy, this would involve identifying the call numbers for specific books and using these numbers to locate the books. Using the card catalog is a system that is a bit more complex and the activity of using the card catalog moves us beyond Level One use and into Level Two.

E-mail can be used for students to contact the teacher and other students in the same course or around the world. The introduction of electronic mail to this level marks a change in the type of interaction the student is having with the Internet, but when this interaction takes the form of communication at a non-instructional level, it remains a Level One use of the Internet.

Level Two

Teachers' usage of the Internet reaches Level Two when they use the Internet in the actual delivery of instruction (as compared to merely supporting instruction with additional content). The teacher can use the Internet to deliver course activities (assignments, collaborations, etc.) to students that have traditionally been provided on paper or a chalk board. At Level Two, this is done with an implicit approach to instruction. This means that the teacher becomes a facilitator of knowledge and creates situations where students can discover the content and create their own meanings. This is to say that the learning is somewhat self-regulated and the teacher assistance is more indirect. Teachers can use the Internet in two ways to accomplish this. First, they can have students make use of Internet tools to explore content and second, teachers can create actual lessons on the Internet.

Teachers can provide assignments directing students to use a Web browser to explore specific Web sites and e-mail to learn course content. The browser is equipped with a "bookmark" tool which gives students the ability to keep track of relevant places as they move through the Internet. There are also search engines that improve one's efficiency in moving from place to place on the Internet. Chat rooms are available for online collaborations with other students, the teacher, or possibly an expert in a certain content area.

Some students are likely to have difficulty using these tools at first. Teachers may begin by modeling the use of these tools for the students to observe. There is a good compromise between teacher modeling and a completely independent student usage. The teacher could create a simple Web page with specific instructions of tool use, URLs, or even links to existing Web sites. This is designed to improve the students' ability to explore rather than teach content. The more the students use this technology, the more proficient they will become. All that is left is for the teachers to use their imagination in creating assignments and activities (i.e., searching for resources, collaborations, etc.).

Level Two e-mail usage finds students submitting assignments as attachments or directly in the message, receiving data and answering questions through the Internet. So, Level Two accounts for e-mail usage expanded to involve instructional issues beyond the simple forms of casual communication. Grabe & Grabe (1998, p. 14) provide a list of e-mail project categories from Harris (1995) to help structure instructional activities. They are listed and described here to help generate ideas for Level Two usage of the Internet:

- Interpersonal Exchanges - "talk" among individuals, between an individual and a group, and among groups. This can be a Level Two usage by making the "talk" questions about content.
- Key Pals - unstructured exchange among individuals or groups; e.g., exchanges to develop cultural awareness or language skills.
- Global Classrooms - study of a common topic and exchange of accounts of what has been learned; e.g., themes in fairy tales.
- Electronic Appearances - e-mail or chat interaction with a guest, perhaps after some preparation; e.g., local engineer responds to questions from students in a physics class.
- Electronic Mentoring - ongoing interaction between expert and student on a specific topic; e.g., college education majors offering middle school students advice on class projects.

- Impersonations - participants interacting "in character"; e.g., correspondence with graduate student impersonating Benjamin Franklin.
- Information Collections - working together to collect and compile information provided by participants.
- Information Exchanges - accumulation of information on some theme; e.g., recycling practices.
- Electronic Publishing - publication of documents based on submission by group members.
- Tele-Field trips - shared observations made during field trips.
- Pooled Data Analysis - data collection from multiple sites, combined for analysis; e.g., cost comparison of gasoline.
- Information Searches - problem solving based on clues and reference sources; e.g., identifying state landmarks or cities in response to a progression of clues.
- Electronic Process Writing - posting written work for critiques before revisions; e.g., composition students commenting on classmates' papers.
- Sequential Creations - working on sequential components of an expressive piece; e.g., adding a stanza to a poem.

The Internet is a tool that has no inherent or required mode of application. The role of this technology in education is the responsibility of the teacher. Teachers can provide entire lessons on Web pages. This can be done with descriptions of assignments, explanations, concepts, examples, and illustrations. This is where a teachers' Web design skills or Web support personnel become important factors in quality and feasibility of creating lessons on the Web.

The teacher needs to become familiar with the world of Web-page construction. It is fair to say that almost anything a teacher would like to include in a lesson is possible, and there are so many Web-page editors available today that the process can be fairly automated. In fact, lots of software that teachers may already use in preparing lessons provides the option of being saved in an HTML (hypertext markup language), Web-ready format. This means that many teachers may already have much of the ground work completed for learning to prepare their own Web pages. To make more intricate Web pages and take full advantage of the tools available, it can be as simple as choosing a Web-page composer and learning it. The Internet would be a good place to search for one because many are available as freeware or shareware. This would allow the beginner to download one for free or for a small registration fee. Learning Web construction may be viewed as programming in hypermedia, usually with a very user-friendly word processor-style editor or a relatively simple authoring language, such as those found with Toolbook or HyperCard.

Level Three

This model has first accounted for increasing student interaction with the Internet and course content. The second focus has dealt with educational philosophy (explicit/implicit roles). Level Three is an extension of the same phenomenon where students are even more dependent on the Internet for course content. Level Three finds complete courses offered and received through the Internet where teachers and students interact with each other and the material exclusively via technology. Level Three involves a greater technical function of Internet tools for interactive lessons, online assessment, real-time collaboration, and more.

The length of a Web-based course (WBC) tends to take twice as long as a normal course. Generally speaking, the time for development planning takes longer as well. One must make many pedagogical decisions about the course. It seems that the most organized teacher (regarding lesson content) will be able to make the easiest transition to a complete WBC. One suggestion is that teachers develop one WBC lesson or unit at a time to make the transition more gradual. This model exemplifies the details of a gradual transition.

At this level, having some form of technical support can be a very crucial element in the success of a WBC. It is important to note that e-mail and e-mail attachments will, most likely, become an important part of your course. This will be for communication, assignments, projects, assessment, etc. Look at any branch of the course and e-mail may be seen as having a role. One problem to anticipate is the finicky nature of file conversion that is inherent in e-mail interaction. There are ways around most of the problems that might be encountered, and most of those are probably not too complicated. Consult your technical support department.

At this point, there are no requirements or essential features that must be included for a WBC. One should still consider issues of course quality, from the perspective of the student, when developing the course. One quality issue is whether or not something more than a mere tutorial is being developed. To ensure that this happens, it seems important to focus on the interactivity of the course. Discussions are a nice way to do this. Many use asynchronous discussions via e-mail, which has the advantage of convenience. Another way to do this is through online discussions (chat sessions) done in real-time. Scheduled and assigned by the teacher, he or she can then directly participate and thus help drive the discussion. Many teachers have said that this process was invaluable. It even gives teachers the opportunity to get to know the students. Verifying the identity of the student can be a concern. Is the person taking the test the same person as the one doing the homework or participating in the discussions? The chat

sessions help the teachers identify and learn the students better.

Another quality concern is whether or not the technology used in the WBC is of high or low technology? It seems fair to say that a teacher wants as many people as possible to have access to their course. That prerequisite dictates that the course should be developed closer to the low end of technology since many people are always playing "catch up." This will surely be a point of constant debate and cause the WBC designer to continually work on revising the course.

Summary

From the teacher whose goal is to increase efficiency, to the teacher concerned with designing a Web-based course, the three-level model structures various types of instructional use. Recognizing that such an organizational system includes a large degree of overlap, all levels include teachers using the Internet to improve instruction. Teachers make use of the Internet incrementally through the use of this model by progressing through the three levels. It is suggested that if the ultimate goal is to develop a WBC (time permitting), that it be done in a modularized approach, one unit at a time.

To help instructors focus on planning a list of ten ideas/issues for the development of a WBC include (in no particular order):

- Identity of student & passwording
- Time - course planning, course length
- Online discussions
- Technical support
- Assignments & activities
- Content
- Student access
- Copyright issues
- Technology - hardware & software
- Testing and assessment

Understanding how and at what levels the Internet may be implemented into education is a first step that will better enable us to meet specifically identified goals and objectives. As teachers are trained in the use of telecommunications and the Internet, this model can direct their study from beginner level through becoming independent distance educators.

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